

## PCT REQUEST

5371/WO/99

Original (for SUBMISSION) - printed on 04.07.2000 04:58:42 PM

0	<b>For receiving Office use only</b>	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	<b>Form - PCT/RO/101 PCT Request</b>	
0-4-1	Prepared using	PCT-EASY Version 2.90 (updated 01.01.2000)
0-5	<b>Petition</b> The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	Israel Patent Office (RO/IL)
0-7	Applicant's or agent's file reference	5371/WO/99
I	Title of invention	PACKET PROCESSOR
II	<b>Applicant</b>	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name	BRIGHTCOM TECHNOLOGIES LTD.
II-5	Address:	16 Ha'melacha Street 48091 Rosh Ha'ayin Israel
II-6	State of nationality	IL
II-7	State of residence	IL
III-1	<b>Applicant and/or inventor</b>	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	BEN-ZE'EV, Yuval
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III-1-6	State of nationality	IL
III-1-7	State of residence	IL

## PCT REQUEST

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III-2	<b>Applicant and/or inventor</b>	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	LIFSHITZ, Joseph
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III-2-7	State of residence	IL
III-3	<b>Applicant and/or inventor</b>	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	KAHN, Ran
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III-3-6	State of nationality	IL
III-3-7	State of residence	IL
III-4	<b>Applicant and/or inventor</b>	
III-4-1	This person is:	applicant and inventor
III-4-2	Applicant for	US only
III-4-4	Name (LAST, First)	MOR, Yeshayahu
III-4-5	Address:	6 Shazar Street 46743 Hertzlia Israel
III-4-6	State of nationality	IL
III-4-7	State of residence	IL
IV-1	<b>Agent or common representative; or address for correspondence</b> The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	LUZZATTO, Kfir
IV-1-2	Address:	LUZZATTO & LUZZATTO P.O. Box 5352 84152 Beer-Sheva Israel
IV-1-3	Telephone No.	972-7-649-7871
IV-1-4	Facsimile No.	972-7-649-7125
IV-1-5	e-mail	L_L@LUZZATTO.CO.IL
IV-2	<b>Additional agent(s)</b>	additional agent(s) with same address as first named agent
IV-2-1	Name(s)	LUZZATTO, Edgar; LUZZATTO, Esther; HACKMEY, Michal; FUERST, Zadok; PYERNIK, Moshe; MANZUROLA, Emanuel; SERUYA, Yehuda; CHECHIK, Haim; BEN-HORIN, Hevion; RUTMAN, Avraham; PRICE, Eyal; SHALEV, Ronit; HACKMEY, Miriam

## PCT REQUEST

5371/WO/99

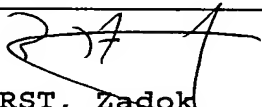
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<b>V</b>	<b>Designation of States</b>	
<b>V-1</b>	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AP: GH GM KE LS MW SD SL SZ TZ UG ZW and any other State which is a Contracting State of the Harare Protocol and of the PCT</p> <p>EA: AM AZ BY KG KZ MD RU TJ TM and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT</p> <p>EP: AT BE CH&amp;LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE and any other State which is a Contracting State of the European Patent Convention and of the PCT</p> <p>OA: BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG and any other State which is a member State of OAPI and a Contracting State of the PCT</p>
<b>V-2</b>	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	<p>AE AL AM AT AU AZ BA BB BG BR BY CA CH&amp;LI CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW</p>
<b>V-3</b>	National Patent (States which have become party to the PCT after the issuance of this version of EASY)	<p>AG</p> <p>BZ</p> <p>DZ</p> <p>MZ</p>
<b>V-5</b>	<b>Precautionary Designation Statement</b> In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
<b>V-6</b>	<b>Exclusion(s) from precautionary designations</b>	NONE
<b>VI-1</b>	<b>Priority claim of earlier national application</b>	
VI-1-1	Filing date	05 July 1999 (05.07.1999)
VI-1-2	Number	130796
VI-1-3	Country	IL

## PCT REQUEST

5371/WO/99

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VI-2	<b>Priority document request</b> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1	
VII-1	<b>International Searching Authority Chosen</b>	European Patent Office (EPO) (ISA/EP)	
VIII	<b>Check list</b>	number of sheets	electronic file(s) attached
VIII-1	Request	4	-
VIII-2	Description	43	-
VIII-3	Claims	8	-
VIII-4	Abstract	2	abstract.txt
VIII-5	Drawings	7	-
VIII-7	TOTAL	64	
	<b>Accompanying items</b>	paper document(s) attached	electronic file(s) attached
VIII-8	Fee calculation sheet	✓	-
VIII-16	PCT-EASY diskette	-	diskette
VIII-18	Figure of the drawings which should accompany the abstract		
VIII-19	Language of filing of the international application	English	
IX-1	Signature of applicant or agent		
IX-1-1	Name (LAST, First)	FURST, Zadok	

## FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

## FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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## ATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

LUZZATTO, Kfir  
Luzzatto & Luzzatto  
P.O. Box 5352  
84152 Beer-Sheva  
ISRAËL

Date of mailing (day/month/year) 27 February 2001 (27.02.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 5371/WO/99	
International application No. PCT/IL00/00391	International filing date (day/month/year) 04 July 2000 (04.07.00)

1. The following indications appeared on record concerning:		
<input checked="" type="checkbox"/> the applicant	<input type="checkbox"/> the inventor	<input type="checkbox"/> the agent <input type="checkbox"/> the common representative
Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
<input type="checkbox"/> the person	<input type="checkbox"/> the name	<input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence
Name and Address CORESMA LTD. 16 Ha'melacha Street 48091 Rosh Ha'ayin Israel	State of Nationality IL	State of Residence IL
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary: <b>Additional applicant for all designated States except US.</b>		
4. A copy of this notification has been sent to:		
<input checked="" type="checkbox"/> the receiving Office	<input checked="" type="checkbox"/> the designated Offices concerned	
<input type="checkbox"/> the International Searching Authority	<input type="checkbox"/> the elected Offices concerned	
<input type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Leitao
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

## PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

LUZZATTO, Kfir  
Luzzatto & Luzzatto  
P.O. Box 5352  
84152 Beer-Sheva  
ISRAËL

Date of mailing (day/month/year) 25 January 2001 (25.01.01)		IMPORTANT NOTICE	
Applicant's or agent's file reference 5371/WO/99			
International application No. PCT/IL00/00391	International filing date (day/month/year) 04 July 2000 (04.07.00)	Priority date (day/month/year) 05 July 1999 (05.07.99)	
Applicant BRIGHTCOM TECHNOLOGIES LTD. et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
AU,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AG,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EA,EE,EP,ES,  
FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,  
MN,MW,MX,MZ,NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,  
The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on  
25 January 2001 (25.01.01) under No. WO 01/06704

**REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)**

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

**REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))**

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.



The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer  J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 5371/WO/98		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IL00/00391	International filing date (day/month/year) 04/07/2000	Priority date (day/month/year) 05/07/1999
International Patent Classification (IPC) or national classification and IPC H04L12/00		
Applicant BRIGHTCOM TECHNOLOGIES LTD. et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 8 sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input checked="" type="checkbox"/> Certain defects in the international application</li> <li>VIII <input type="checkbox"/> Certain observations on the international application</li> </ul>		
Date of submission of the demand 28/01/2001		Date of completion of this report 20.09.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Droneau, S Telephone No. +49 89 2399 7954 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IL00/00391

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, pages:

1-43 as originally filed

### Claims, No.:

1-36 as received on 07/09/2001 with letter of 03/09/2001

### Drawings, sheets:

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/IL00/00391

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims 1-36
	No: Claims
Inventive step (IS)	Yes: Claims 1-36
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-36
	No: Claims

**2. Citations and explanations**  
**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

**I**

The following documents have been considered for the purposes of this report:

- D1: GOLDBERG L: 'MCNS/DOCSIS MAC CLEARS A PATH FOR THE CABLE-MODEM INVASION' ELECTRONIC DESIGN, US, PENTON PUBLISHING, CLEVELAND, OH, vol. 45, no. 27, 1 December 1997 (1997-12-01), pages 69-70, 74, 78, 80, XP000755759 ISSN: 0013-4872
- D2: EP-A-0 765 061
- D3: MONTEIRO F ET AL: 'A NEW PROCESSOR ARCHITECTURE DEDICATED TO DIGITAL MODEM APPLICATIONS' MONTEREY, CA, MAY 31 - JUNE 3, 1998, NEW YORK, NY: IEEE, US, 31 May 1998 (1998-05-31), pages 494-497, XP000873538 ISBN: 0-7803-4456-1

**II**

This invention generally relates to the broadband communication systems for conveying digital data: More particularly, this invention relates to a programmable, general purpose **Packet Processor** (independent claim 1), which can be used, for example, as a Media Access Control module for modems.

It is therefore an object of the present invention to provide a Packet Processor for the broadband and wide band communication schemes, which is capable of implementing functions that must be handled in real time.

Document D2, which is the most relevant prior art, discloses a computer network for high-speed data communication in which each client station contains a cable modem. It allows to avoid contention and to provide a good channel efficiency rate. The difference between the invention and D2 is that in the invention, the Packet Processor and the Modulator-Demodulator part of the modem are two **separate** units.

Document D1 discloses the DOCSIS specification which outlines the physical layer interfaces, MAC and transport protocols, security provisions, and other specification necessary for designing interoperable cable data components. It also discloses the BCM3220 MAC chip which incorporates all control, stream processing, and security functions required for a DOCSIS-compliant modem. In figure 2, the BCM3220 MAC chip contains a **Message Processor** including a MAC header processing and a MAC message processor (with CRC). No further precise description of the configuration of this message processor is given in D1, which can be considered as defining the general state of the art and which is not considered to be of particular relevance.

Document D3 describes a processor architecture dedicated to digital modem applications. No further precise description of the configuration of the blocks of the disclosed modem is given in D3, which can also be considered as defining the general state of the art and which is not considered to be of particular relevance.

An inventive step is therefore acknowledged and claims 1 to 36 fulfill the requirements of Article 33(3) PCT.

## **VII. Certain defects in the international application**

1. The reference to the "spirit" of the invention has not been deleted on page 43, line 8 (PCT Guidelines C-III-4.3a and Article 6 PCT).

CLAIMS

1. A Packet Processor (1) for processing received and transmitted data streams made of packets, each packet mainly comprises a header and a payload section, characterized by comprising:

(A) A receiving part (23) comprising:

- (a) A receiving physical layer interface (40) by which a flow of data stream is conveyed from a modem to the Packet Processor;
- (b) A receiving Tubular Bus receiving the said flow of data stream which is conveyed from the modem to the Packet Processor (1), said receiving Tubular Bus conveying data, while processed, in the direction from the said receiving physical layer interface (6) to a host interface;
- (c) At least one processing unit (51, 52) between sections of the said first Tubular Bus for sequentially receiving portions of a data stream from a section of the Tubular Bus, processing the same, and outputting the processed data to a next section of the said first Tubular Bus;
- (d) One FIFO storage unit (70) before and one FIFO storage unit after (71) any of the said processing units on the receiving Tubular Bus, for providing a temporary storage for portions of the data stream; and
- (e) A first host interface for receiving data from the receiving Tubular Bus and conveying it to a host.

(B) A transmitting part (24) comprising:

-45-

- (f) A second host interface for receiving data from the host and conveying it to a second Tubular Bus;
  - (g) A transmitting Tubular Bus for receiving the said flow of data stream which is conveyed from the host to the Packet Processor, said transmitting Tubular Bus conveying the data stream, while processed, in the direction from the said second host interface to a transmitting physical layer interface;
  - (h) At least one processing unit (53, 54) between sections of the said transmitting Tubular Bus, for sequentially receiving portions of the data stream from a section of the Tubular Bus, processing the same, and outputting the processed data to the next section of the said transmitting Tubular Bus;
  - (i) One FIFO storage unit before (73) and one FIFO storage unit (74) after any of the said processing units on the second Tubular Bus, for providing a temporary storage for portions of the data stream; and
  - (j) A transmitting physical layer interface (40) for receiving processed data from the transmitting Tubular Bus and conveying the same to a modem.
- (C) A Backbone Bus (244) for conveying management data, instructions, and addresses between various components of the Packet Processor;
- and
- (D) Timing and control means (65) for administering the operation of the Packet Processor, and particularly the timing of using transmission slots for the transmit path.

-46-

2. A Packet Processor according to claim 1, wherein each of the processing units functions independently, but simultaneously, with the other processing units.
3. A Packet Processor according to claim 1, comprising two processing units in the receiving part and two processing units in the transmitting part.
4. A Packet Processor according to claim 3, wherein, in the receiving part, the processing unit closer to the modem handles the tasks of mainly processing the header, deframing the data stream, and detecting and correcting errors in the header of the received data stream; the processing unit closer to the host, mainly handles the tasks of logical analysis, including determining the length and type of the packets (management, or data), possible concatenation of packets, decrypting the received data stream, and error detecting and correcting of the data portion of the data stream; in the transmitting part, the processing unit closer to the host mainly handles the task of controlling allocation, and prioritizing the transmission sequences, and activities related to the creation of the header CRC of the transmitted data stream; the processing unit closer to the modem mainly handles the task of the creation of the main CRC, encryption, and framing of the transmitted data.
5. A Packet Processor according to claim 1, wherein each processing unit comprises a processor and at least one co-processor.

-47-

6. A Packet Processor according to claim 1, wherein each processing unit also comprises an internal memory.
7. A Packet Processor according to claim 6, wherein the internal memory of each processing unit includes an instruction cache memory and a Scratch Pad RAM.
8. A Packet Processor according to claim 1, further comprising a connection to an external memory unit.
9. A Packet Processor according to claim 1, wherein the communication with the external memory unit is made by a processing unit of the packet processor, via the Backbone Bus, and an external bus arbiter.
10. A Packet Processor according to claim 1, wherein each of the FIFO units comprises a plurality of memory cells for providing a sequential temporary storage for portions of the data stream.
11. A Packet Processor according to claim 1, further comprising a connection to one or more external devices.
12. A Packet Processor according to claims 11 and 8, wherein one of said devices is a storage unit, containing a code for operating the processor, said

-48-

code being downloaded into the internal memory of each processing unit of the packet processor, and into said external memory unit when initializing the packet processor.

13. A Packet Processor according to claim 1, further comprising an External Bus for communication with an external memory unit.
14. A Packet Processor according to claim 13, wherein the communication with the external memory unit is made by a processing unit of the packet processor, via the External Bus, and an external bus arbiter.
15. A Packet Processor according to claim 1, further comprising a debugging unit for assisting in the debugging of the packet processor.
16. A Packet Processor according to claim 1, further comprising a DMA control unit for enabling internal transfer of data blocks between internal components of the packet processor, and transfer of data blocks between internal components of the packet processor and components external to the packet processor.
17. A Packet Processor according to claim 1 fabricated in a VLSI form.
18. A Packet Processor according to claim 1, further comprising a Serial Interface for carrying out communication with external serial components.

-49-

19. A Packet Processor according to claim 1, further comprising an Interrupt Central Unit for handling interruptions to components of the Packet Processor.
20. A Packet Processor according to claim 1 for use in communication apparatus.
21. A Packet Processor according to claim 20, wherein said communication apparatus is a modem.
22. A Packet Processor according to claim 20, wherein said communication apparatus is a modem for TV cables.
23. A Packet Processor according to claim 20, for use as a MAC module for a modem.
24. A Packet Processor according to claim 20, for use in a communication routers.
25. A Packet Processor according to claim 1, wherein each processing unit comprises means for embedding one or more macro-instruction with the data flowing in the tubular bus, said macro instruction flowing with the

-50-

data over the tubular bus to a destination component downstream the tubular bus, and is used for controlling said component.

26. A Packet Processor according to claim 25 wherein the component in the tubular bus which is the destination of said macro-instruction is a FIFO.
27. A Packet Processor according to claim 1 wherein the second FIFO downstream the receiving bus is further associated with an address filter.
28. A Packet Processor according to claim 27 wherein the said address filter is used for comparing a destination address that is detected in the data stream with a list of addresses stored in said address filter, and according to the result of the comparison, determines whether an operation should be taken or not on at least a portion of the data stream.
29. A Packet Processor according to claim 27 wherein one operation that is taken based on said comparison is a flushing of the content of a FIFO and an ignoring of a portion of the data stream.
30. A Packet Processor according to claim 1 wherein each of the processing units of the transmitting and/or receiving parts is a RISC processor.
31. A Packet Processor according to claim 30 wherein each RISC processor of the transmitting and/or receiving parts is of an ARC type processor.

-51-

32. A packet processor according to claim 1, wherein the timing and control means are also used for administering the allocation of timing slots for the transmitted data stream.
33. A Packet Processor according to claim 1 wherein the first and second host interfaces are fabricated within a same interface.
34. A Packet Processor according to claim 1, for use in a modem for a wireless LAN.
35. A Packet Processor according to claim 1, for use in Internet Protocol telephone modems.
36. A Packet Processor according to claim 1 wherein the backbone bus is a ring type bus.

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(54) Title: PACKET PROCESSOR

(57) Abstract: A Packet Processor for a communication apparatus, for processing received and transmitted data streams made of packets, each packet mainly comprises a header and a payload section, comprising: (A) A receiving part. (B) A transmitting part. (C) A Backbone Bus for conveying management data, instructions, and addresses between various components of the Packet Processor; and (D) Timing and control means for administering the operation of the Packet Processor, and particularly the timing of using transmission slots for the transmit path.

WO 01/06704 A2

# INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

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## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GOLDBERG L: "MCNS/DOCSIS MAC CLEARS A PATH FOR THE CABLE-MODEM INVASION" ELECTRONIC DESIGN, US, PENTON PUBLISHING, CLEVELAND, OH, vol. 45, no. 27, 1 December 1997 (1997-12-01), pages 69-70, 74, 78, 80, XP000755759 ISSN: 0013-4872 page 8, left-hand column, paragraph 5 -right-hand column, paragraph 4 figure 2	1
A	EP 0 765 061 A (HEWLETT PACKARD CO) 26 March 1997 (1997-03-26) page 5, line 24 - line 46; figure 3 page 13, line 54 -page 14, line 12; figure 8	1

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>MONTEIRO F ET AL: "A NEW PROCESSOR ARCHITECTURE DEDICATED TO DIGITAL MODEM APPLICATIONS"  MONTEREY, CA, MAY 31 - JUNE 3, 1998, NEW YORK, NY: IEEE, US,  31 May 1998 (1998-05-31), pages 494-497, XP000873538  ISBN: 0-7803-4456-1  page 494, left-hand column, paragraph 3  -page 495, right-hand column, paragraph 6</p>	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0765061 A	26-03-1997	US 5787483 A JP 9172452 A	28-07-1998 30-06-1997